WHAT IS CLAIMED IS:

1. A method of depositing a metallic film on a substrate comprising:
   a. placing a substrate comprising an upper surface, a lower surface, and silicon in a reaction cell, wherein at least one of said surfaces is coated with a coating selected with from the group consisting of TaN, TiN, Ta, WN, WCN, TaSiN, and TiSiN;
   b. injecting a source metal into the cell through the use of a carrier gas that is bubbled through water into the cell during a first pulse of 1-20 seconds duration;
   c. injecting an inert gas into the cell during a second pulse of 1-10 seconds duration;
   d. injecting a reducing agent into the cell during a third pulse of 1-10 seconds duration; and
   e. injecting an inert gas into the cell during a fourth pulse of 1-10 seconds duration.

2. The method of claim 1, wherein the reducing agent is selected from the group consisting of alcohols and aldehydes.

3. The method of claim 1, wherein the source metal comprises a copper II compound.

4. The method of claim 3, wherein the source metal is a hydrated copper II compound.

5. The method of claim 1, wherein the carrier gas is an inert gas.

6. The method of claim 1, wherein the carrier gas is argon.

7. The method of claim 1, wherein the carrier gas is hydrogen.

8. The method of claim 1, wherein the source metal comprises an anhydrous copper compound.

9. The method of claim 1, wherein the source metal comprises a copper beta-diketonates.

10. The method of claim 1, wherein the source metal comprises a silver I compound.

11. The method of claim 1, wherein the source metal comprises a silver II compound.

12. The method of claim 1, wherein the source metal comprises a copper I compound.

13. The method of claim 1, wherein said inert gas is selected from a group consisting of nitrogen, argon and helium.

14. The method of claim 1 wherein said coating has a thickness in the range of 5-100 nanometers.

15. A method for etching copper films on a substrate comprising:

a. placing a substrate having a temperature in the range of 120° C to 300° C and comprising an upper surface, a lower surface, and silicon in a reaction cell, wherein at least one of said surfaces is coated with a copper layer.

b. injecting an oxidizing agent into the cell through the use of a carrier gas during a first pulse of 1-20 seconds duration;

c. injecting purge pulse comprising an inert gas into the cell during a second pulse of 1-10 seconds duration;

d. injecting a reducing agent into the cell during a third pulse of 1-10 seconds duration; and

e. injecting an inert gas into the cell during a fourth pulse of 1-10 seconds duration.

16. The method of claim 15, wherein the reducing agent is hydrogen hexafluoroacetylacetonate (H (hfac)).

17. The method of claim 15, wherein the oxidizing agent is a gas comprising oxygen.

18. The method of claim 15, wherein the oxidizing agent is water in a gaseous phase.

19. The method of claim 15, wherein said inert gas is selected from a group consisting of nitrogen, argon and helium.

20. A method of depositing a metallic film on a substrate comprising:

a. placing a substrate comprising an upper surface, a lower surface, and silicon in a reaction cell, wherein at least one of said surfaces is coated with a coating having a thickness in the range of 5-100 nanometers, and selected with from the group consisting of TaN, TiN, Ta, WN, WCN, TaSiN, and TiSiN;

b. injecting a source metal into the cell through the use of an inert carrier gas that is bubbled through water into the cell during a first pulse of 1-20 seconds duration;

c. injecting an inert gas into the cell during a second pulse of 1-10 seconds duration;

d. injecting a reducing agent selected from the group consisting of alcohols and aldehydes into the cell during a third pulse of 1-10 seconds duration; and

e. injecting an inert gas into the cell during a fourth pulse of 1-10 seconds duration.

21. A method of depositing a metallic film on a substrate comprising:

a. placing a substrate comprising an upper surface, a lower surface, and silicon in a reaction cell, wherein at least one of said surfaces is coated with a coating selected with from the group consisting of TaN, TiN, Ta, WN, WCN, TaSiN, and TiSiN;

b. injecting a source metal into the cell through the use of a carrier gas that is bubbled through water into the cell during a first pulse;

c. purging excess source metal by injecting an inert gas into the cell during a second pulse;

d. injecting a reducing agent into the cell during a third pulse; and

e. removing excess reducing agent by injecting an inert gas into the cell during a fourth pulse.

22. The method of claim 21, wherein the reducing agent is selected from the group consisting of alcohols and aldehydes.

23. The method of claim 21, wherein the carrier gas is an inert gas.

24. The method of claim 21, wherein said source metal is selected from a group consisting of a silver I compound, a silver II compound, a copper I compound, a copper II compound, and a copper beta-diketonates.